U. S. F. W. S. Spec. Sci. Rep't. – Fisheries
LIBRARY
JUL 6 1960
FISH & WILDLIFE SERVICE
D
C
B
#
336
36
361
257f

AGE AND SIZE COMPOSITION OF THE MENHADEN CATCH ALONG THE ATLANTIC COAST OF THE UNITED STATES, 1956

WITH A BRIEF REVIEW OF THE COMMERCIAL FISHERY

SPECIAL SCIENTIFIC REPORT–FISHERIES No. 336

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

United States Department of the Interior, Fred A. Seaton, Secretary
Fish and Wildlife Service, Arnie J. Suomela, Commissioner
Bureau of Commercial Fisheries, Donald L. McKernan, Director

AGE AND SIZE COMPOSITION OF THE MENHADEN CATCH ALONG THE ATLANTIC COAST OF THE UNITED STATES, 1956

With a Brief Review of the Commercial Fishery

by

Fred C. June and John W. Reintjes
Fishery Research Biologists

United States Fish and Wildlife Service
Special Scientific Report--Fisheries No. 336

Washington, D. C.
April 1960

TABLE OF CONTENTS

	Page
Introduction	1
The 1956 commercial fishery	2
South Atlantic Area	2
Chesapeake Bay Area	3
Middle Atlantic Area	3
North Atlantic Area	3
North Carolina fall fishery	4
Catch statistics of the purse-seine fishery	4
Sampling of the commercial catches	6
Age composition	6
Length and weight composition	9
Summary	11
Appendix	12-38

ILLUSTRATIONS

Figure		Page
Frontpiece:	Part of the menhaden purse-seine fleet moored at Beaufort, N. C. during the fall fishing season	
1.	Chart showing areas used in summarizing Atlantic menhaden catch data	2
2.	Distribution of fishing effort in the South Atlantic Area, 1956	5
3.	Distribution of fishing effort in the Chesapeake Bay and Middle Atlantic Areas, 1956	5
4.	Distribution of fishing effort in the North Atlantic Area, 1956	6
5.	Age composition of samples from purse-seine catches, 1956	7
6.	Length composition of samples from purse-seine catches, 1955-56	9

TABLES

Number — Page

1. Catch, catch per unit effort, and total fishing effort, Atlantic menhaden fishery, 1956 4

2. Number of samples taken from commercial catches at various locations in 1956 6

3. Age composition of samples from purse-seine catches, 1955-56. 7

4. Age composition of samples from purse-seine catches, by area, 1955-56 8

5. Age composition (in percent) of samples from spring pound-net catches, 1956 9

6. Mean fork length and weight of fish at each age in samples from purse-seine catches, by area, 1955-56 10

APPENDIX TABLES

Number — Page

1. Length frequency distributions in samples from purse-seine catches, South Atlantic Area, excluding the North Carolina fall fishery, 1956 12

2. Length frequency distributions in samples from spring pound-net catches, Chesapeake Bay Area, 1956 13

3. Length frequency distributions in samples from purse-seine catches, Chesapeake Bay Area, 1956 14

4. Length frequency distributions in samples from spring pound-net catches, Middle Atlantic Area, 1956 15

5. Length frequency distributions in samples from purse-seine catches, Middle Atlantic Area, 1956 16

6. Length frequency distributions in samples from purse-seine catches, North Atlantic Area, 1956 17

APPENDIX TABLES (continued)

Number Page

7. Length frequency distributions in samples from fall and winter purse-seine catches, North Carolina, 1956 18

8. Weight frequency distributions in samples from purse-seine catches South Atlantic Area, excluding the North Carolina fall fishery, 1956 20

9. Weight frequency distributions in samples from purse-seine catches, Chesapeake Bay Area, 1956 21

10. Weight frequency distributions in samples from spring pound-net catches, Chesapeake Bay Area, 1956 22

11. Weight frequency distributions in samples from spring pound-net catches, Middle Atlantic Area, 1956 24

12. Weight frequency distributions in samples from purse-seine catches, Middle Atlantic Area, 1956 26

13. Weight frequency distributions in samples from purse-seine catches, North Atlantic Area, 1956 28

14. Weight frequency distributions in samples from fall and winter purse-seine catches, North Carolina, 1956 30

15. Mean fork length and weight in samples from purse-seine catches, South Atlantic Area, excluding the North Carolina fall fishery, 1956 32

16. Mean fork length and weight in samples from spring pound-net catches, Chesapeake Bay Area, 1956 33

17. Mean fork length and weight in samples from purse-seine catches, Chesapeake Bay Area, 1956 34

18. Mean fork length and weight in samples from spring pound-net catches, Middle Atlantic Area, 1956 35

19. Mean fork length and weight in samples from purse-seine catches, Middle Atlantic Area, 1956 36

20. Mean fork length and weight in samples from purse-seine catches, North Atlantic Area, 1956 37

21. Mean fork length and weight in samples from purse-seine catches, North Carolina fall fishery, 1956 38

AGE AND SIZE COMPOSITION OF THE MENHADEN CATCH ALONG THE ATLANTIC COAST OF THE UNITED STATES, 1956
With a Brief Review of the Commercial Fishery

by

Fred C. June and John W. Reintjes
U. S. Fish and Wildlife Service
Beaufort, North Carolina

ABSTRACT

The 1956 catch of Atlantic menhaden (Brevoortia tyrannus) amounted to 766,000 tons. Apparent abundance, as measured by catch per purse-seine set, was highest in the North Atlantic Area and lowest in Chesapeake Bay. Geographical distribution of fishing effort is shown.

Samples for age, size, and sex determinations were obtained from the purse-seine and pound-net catches landed from Fernandina Beach, Florida, to Portland, Maine. Age composition showed that the 1955 years class (age-1 fish) accounted for more than half of the total catch. This year class dominated the summer catches in the South Atlantic and Chesapeake Bay Areas as well as the fall catches in North Carolina, while the 1954 year class (age-2 fish) dominated in the Middle Atlantic Area, and the 1951 year class (age-5 fish) dominated in the North Atlantic Area. Fish of the dominant year class in each of these areas were smaller in 1956 than in the previous year.

INTRODUCTION

From its beginning, in about 1850, the menhaden fishery along the Atlantic coast of the United States has ranked as one of the leading fishing industries in the Western Hemisphere. As in most marine fisheries, there have been tremendous variations in yield. The catch in one area of the coast has often differed markedly from that in other areas in the same season, and periods of coastwise abundance have been followed by periods of scarcity. Fluctuations in the abundance of fish have become one of the major problems confronting the menhaden industry.

In 1955 an investigation of the biology of the Atlantic menhaden (Brevoortia tyrannus) and of the menhaden fishery of the Atlantic coast was undertaken by the Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, in order to determine the effects both of fishing and of natural factors on the resource and the extent to which fluctuations in the catch may be predicted.[1/] During the 1955-56 the major effort has been concerned with sampling of the commercial catches for the purpose of investigating the relation of size and age composition to fluctuations in the catch.

The purpose of this series of reports, of which this is the second, is to document the events in the fishery and to place on record the data resulting from the coastwise catch sampling program. Except to point out certain outstanding features, no attempt has been made to analyze or interpret the data. The report summarizes the age, length, weight, and sex composition of samples taken from the purse-seine and pound-net catches of Atlantic menhaden in

1/ "Age and size composition of the menhaden catch along the Atlantic coast of the United States, 1952-55, with a brief review of the commercial fishery," by Fred C. June and John W. Reintjes. U. S. Fish and Wildlife Service, Special Scientific Report--Fisheries No. 317, August 1959, 65 pp.

1956. From these data and plant and logbook records of vessel landings and fishing activities, calculations have been made of the numbers of fish caught at each age, catch per unit of effort, and total fishing effort along the Atlantic coast. A chronological review of the salient events and features which characterized the 1956 commercial fishery also is given. Except for the North Carolina fall fishery, discussion of the fishery and summaries of the catch-sampling data are presented by geographical areas (fig. 1). Because of its uniqueness, the North Carolina fall fishery is discussed separately.

We wish to acknowledge the interest and cooperation of vessel captains and pilots who furnished records of their daily fishing activities. Plant managers and owners provided detailed records of vessel landings and assisted in many ways in the conduct of the investigations.

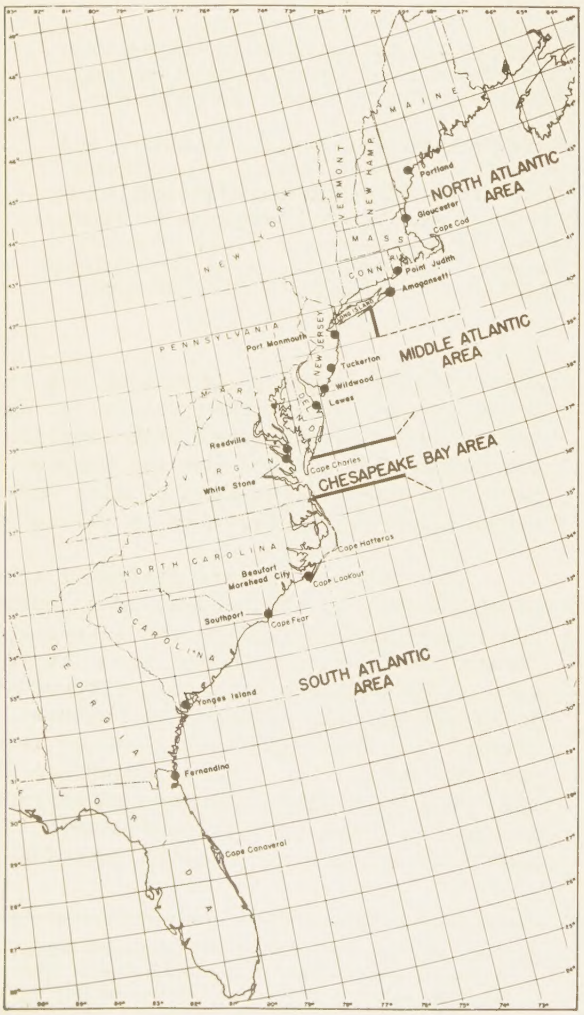

Figure 1.--Areas used in summarizing Atlantic menhaden catch data. (Locations of menhaden reduction plants are shown by dots)

THE 1956 COMMERCIAL FISHERY

The total catch of Atlantic menhaden in 1956 was 766,000 tons (table 1, page 4). This was an increase of 65,000 tons over the 1955 catch and represented the greatest annual yield of a single species ever taken by United States fishermen. With the exception of catches in Chesapeake Bay, catches in all major areas exceeded those of 1955, with the South Atlantic summer fishery showing the greatest percentage increase (52 percent). Nearly the entire catch was processed into fish meal, oil, and condensed solubles, with only small quantities being used for bait.

South Atlantic Area

The first purse-seine catches of the 1956 fishing season were made on April 4 north of Fernandina, Fla., in the vicinity of St. Augustine and marked the southern limit of the fishery. Only three landings were made during the following week, but on April 13 numerous schools were encountered off Fernandina Beach, and during the next 6 weeks excellent catches were recorded by a fleet of 12 vessels operating out of that port. By the end of May over 21,000 tons of menhaden had been landed from these waters, the highest yield for a similar period since 1952. Catches dropped markedly in early June when the schools were observed moving northward, and except for a few fair catches during the last week in June and the first week in July, fishing was poor through the remainder of the summer. The last landings of the season were made on October 24 off Fernandina Beach. The estimated catch in Florida waters amounted to 34,000 tons, an increase of 88 percent compared with 1955.

In North Carolina waters, schools were encountered simultaneously off Southport and Beaufort on May 7, and sizable catches were recorded by a fleet of 18 vessels through the remainder of the month. The most productive fishing, however, occurred in June when several large bodies of fish slowly made their way northward along the North Carolina coast. Over 17,000 tons

were landed at the two ports during the month. The first abruptly disappeared off Southport during the last week in June and, except for one small school, were not observed in this locality again until July 11 when a large body of fish appeared off the mouth of the Cape Fear River. The fish again disappeared in mid-August and were largely absent from those waters until September 6 when a relatively large body of fish again was sighted along the beach, west of the Cape Fear River. Fishing continued in this locality through October 9 when the schools once more disappeared. Fishing in the vicinity of Beaufort reached a peak in June. Although the first week in July virtually marked the end of summer fishing in ocean waters in this locality, landings inside Bogue and Core Sounds continued to be good through September. The last catch of the summer season was made on October 9 off Beaufort Inlet. Total summer landings in North Carolina waters exceeded 39,000 tons as compared with 25,000 tons in 1955.

Chesapeake Bay Area

The first fish marking the commencement of the "spring run" of menhaden into Chesapeake Bay appeared in the pound nets located off Reedville and White Stone, Va., during the first week in April. Although fish had occurred in the catches throughout the previous month, landings were extremely light and the fish variable in size. The total pound-net catch in Chesapeake Bay in 1956 was estimated at slightly over 5,000 tons.

Purse-seine fishing in Chesapeake Bay by a fleet of 23 vessels began on May 28, with the first catches made in Tangier Sound. Summer fishing was moderately productive in the lower Bay through September 25. Adverse weather was primarily responsible for decrease landings throughout the remainder of the season. Fishing was terminated on October 17, nearly 3 weeks in advance of the closing date in the previous year (November 3). The catch of 89,000 tons was about 42 percent below that of 1955 when a catch of 153,000 tons established the second highest record in the history of the Bay fishery.

Middle Atlantic Area

The first menhaden caught in the Middle Atlantic Area were large fish taken on April 4 by pound nets located off northern New Jersey and Staten Island. Catches gradually increased during the following 3 weeks, and on April 18 heavy landings were recorded simultaneously at Beach Haven, Point Pleasant, and Port Monmouth, N. J. A high level of production continued in this area of the coast until the third week in May, when the fish commenced schooling at the surface, and pound-net catches dropped markedly. The estimated pound-net landings for this area in 1956 amounted to 18,000 tons.

The first purse-seine fishing in the Middle Atlantic occurred in Raritan Bay on May 22, but fish reportedly were sparsely schooled, and the catches were small. On May 28 numerous schools were located off the mouth of Delaware Bay, and within a week productive fishing by a fleet of 45 vessels occurred from Cape Charles, Va., to Rockaway Inlet, N. Y. Of the record catch of 402,000 tons, 92 percent was taken from Cape Charles, Va., to Jones Inlet, N. Y., by September 25. Most of the remainder of the catch came from southern Long Island waters where the larger, older fish appeared in tremendous bodies following a week of stormy weather in late September. Productive fishing continued in this area until October 17, when the fish abruptly disappeared, terminating the most successful season in the history of the Middle Atlantic Area.

North Atlantic Area

In the North Atlantic Area the 1956 purse-seine catch amounted to 96,000 tons. This was an increase of 13,000 tons over that of the previous year and represented the highest yield recorded in northern waters since the late 1800's when the fishery centered in New England. The first purse-seine landing of the season was made on June 5 in Narragansett Bay by a Point Judith, R. I., vessel. On June 8 fish were encountered off Chatham (eastern end of Cape Cod) by a Gloucester, Mass., vessel, and within 3 days, 13 Gloucester vessels were operating in this area. The Gloucester fleet was joined by the Amagansett, N. Y., fleet in following the schools as they moved northward along the Cape into Massachusetts and Cape Cod Bays. Fishing by both fleets (30 vessels) continued in the latter area through midsummer, with schools reportedly fairly numerous from Chatham

Table 1.--Catch, catch per unit of effort, and total fishing effort, Atlantic menhaden fishery, 1956.

(Effort data for 1955 given in parentheses)

Area	Catch (tons)[1]				Catch per unit effort purse seine fleet (tons)[3]		Total fishing effort (Number of purse seine sets)	
	Purse-seine	Pound-net	Other[2]	Total				
South Atlantic	73,000	-	-	73,000	24.5	(18.8)	2,980	(2,553)
Chesapeake Bay	89,000	5,000	1,000	95,000	13.9	(27.2)	6,403	(5,625)
Middle Atlantic . . .	402,000	18,000	-	420,000	28.0	(24.6)	14,357	(13,333)
North Atlantic	95,000	2,000	-	97,000	35.2	(28.8)	2,699	(2,882)
North Carolina fall fishery . . .	81,000[4]	-	-	81,000	31.8	(38.7)	2,547	(1,886)
Total	740,000	25,000	1,000	766,000	25.5	(26.0)	29,020[5]	(26,279)

1/Source: "Fishery Statistics of the United States, 1956," by Edward A. Power, U. S. Fish and Wildlife Service, Statistical Digest No. 43, 476 pp.
2/Includes otter trawl, gill net, haul seine, and fyke net.
3/Average catch per purse-seine set.
4/North Carolina fall fishery normally extends into January, therefore, catch total for North Carolina includes January 1957, but not January 1956. Seasonal breakdown of the catch obtained from U. S. Fish and Wildlife Service, C.F.S. Nos. 1492 and 1742.
5/Slight discrepancy due to rounding off of the figures.

(including Plymouth Bay) to Portsmouth, N. H. Commencing in late August, fishing by the Amagansett vessels shifted from Cape Cod waters to the eastern end of Long Island and Long Island Sound where dense schools were intercepted as they moved southward. The total estimated catch from these waters during the last 7 weeks of the season exceeded 20,000 tons. During this period excellent catches also were recorded in Narragansett Bay by 6 vessels fishing out of Point Judith, R. I. The purse-seine fleet at Portland, Maine, (3 vessels) did not commence fishing in Maine waters until July 18, although several landings from Cape Cod Bay were recorded on July 6 and 8. Most of the catches in Maine waters were made between Small Point and Bailey's Island, and although schools were reported to be large, they were scattered, and fish were difficult to catch. Fishing terminated at Portland on September 4, at Gloucester on September 25, and at Amagansett October 22.

North Carolina Fall Fishery

The fall fishing season in North Carolina waters commenced off Beaufort on November 7. Strong winds and heavy seas restricted fishing during the following week and only scattered, light landings were recorded. On November 14 a large body of fish was located off Drum Inlet; however, after only 2 days of moderately successful fishing, stormy weather accompanied by rough seas forced the vessels to remain in port during the following 4 days. On November 20 a heavy concentration of fish again was encountered in the vicinity of Drum Inlet, and a fleet of 59 vessels recorded excellent catches of large fish. During the ensuing 4 weeks, vessels ranged between Hatteras Inlet and Core Banks, with heaviest fishing occurring off Drum Inlet and Cape Lookout. Over 72,000 tons were landed between November 20 and December 20; this was the highest catch ever recorded for a similar period in the history of the North Carolina fall fishery. Only a few scattered landings of large fish were made off Core Banks during the Christmas holidays, but young-of-the-year fish which began congregating in the vicinity of Cape Lookout during this period provided increased catches in January. Over 5,100 tons of this age group were landed before the fish disappeared from these waters on January 23. The total catch for the 1956 North Carolina fall season amounted to slightly over 81,000 tons. This was an increase of 8,000 tons over the 1955 catch.

Catch Statistics of the Purse-Seine Fishery

Pertinent catch statistics on the 1956 purse-seine fishery (with comparable

data for 1955 shown in parentheses) are given in table 1. Catch per unit of effort and total fishing effort were calculated from fishing logbook records kept by the vessel captains or pilots and daily catch records furnished by the processing plants. Complete logbook records were obtained from only 50 percent of the total number of vessels engaged in the fishery. To compensate for the fact that only a portion of each area fleet was represented in the data, adjustment factors, based upon the ratio of total number of vessel landing days to logbook days, were used in the calculations for each area.

The purse-seine catch in 1956 amounted to 740,000 tons, an increase of 55,000 tons over that of the previous year. The greater catch in 1956 was produced by a greater amount of fishing effort, accompanied by an increase in apparent abundance (catch per set) on most of the summer fishing grounds. The lower apparent abundance (31.8 tons) on the North Carolina fall fishing grounds in 1956 as compared with that of the previous years (38.7 tons) probably was due largely to increased competition between fishing

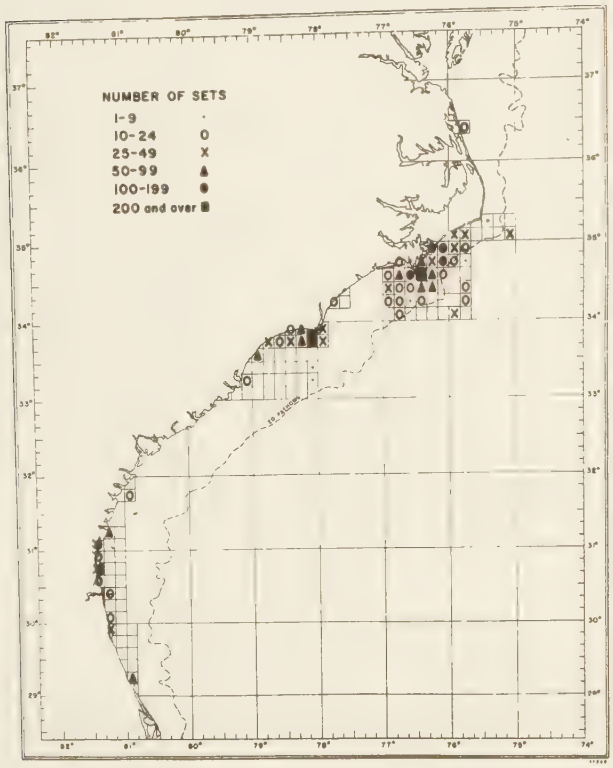

Figure 2.--Distribution of purse-seine sets in the South Atlantic Area, 1956.

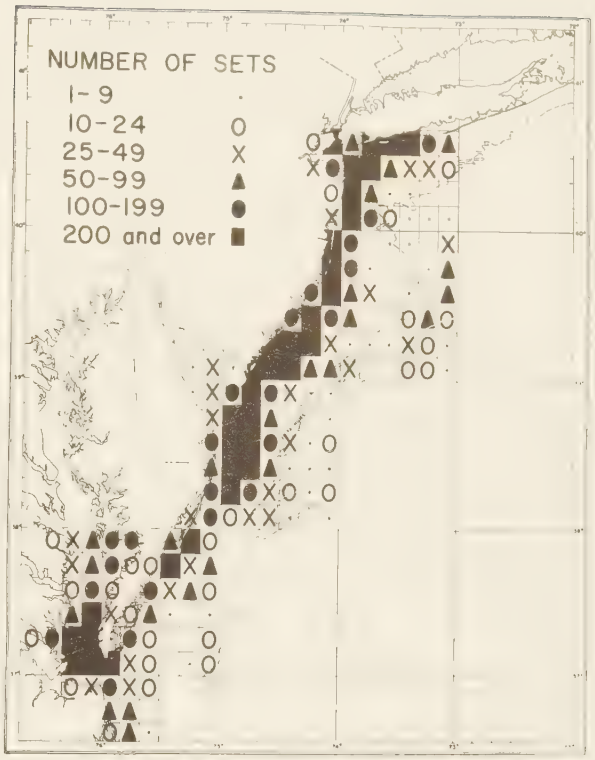

Figure 3.--Distribution of purse-seine sets in the Chesapeake Bay and Middle Atlantic Areas, 1956.

gear during the 195[illegible] season (59 vessels in 1956 as compared with 49 in 1955). Apparent abundance was lowest in Chesapeake Bay (13.9 tons) and greatest in the North Atlantic (35.2 tons) in 1956.

The distribution of the total estimated number of purse-seine sets in 1956, by unit areas of 10 minutes of latitude and 10 minutes of longitude, is shown in figures 2-4. The areas heaviest effort (200 sets and over) included: coastal waters off Fernandina Beach, Fla., waters continguous to Capes Fear and Lookout, N. C., lower Chesapeake Bay, the coastal waters of Virginia, Maryland, Delaware, New Jersey, and the western end of southern Long Island, and Massachusetts Bay. These unit areas (shown by the black squares) accounted for over 60 percent of the total calculated number of purse-seine sets. Interviews with vessel captains indicated that those sets recorded roughly beyond the 20-fathom curve off the New Jersey, Delaware, and Virginia coasts probably were incorrectly located and most likely should be credited to the corresponding inshore unit areas. In comparison with 1955, a greater amount of

fishing effort was expended in most localities. Notable exceptions occurred in Delaware Bay, Long Island Sound, Cape Cod Bay, and the northern Gulf of Maine in 1956.

SAMPLING OF THE COMMERCIAL CATCHES

The sampling procedure essentially consisted of taking 100-fish samples from randomly selected purse-seine and pound-net catches. The fork lengths of the fish in each sample were measured; in addition every fifth fish was weighed, sexed, and scales were removed for subsequent age determination. Further details concerning the sampling procedure and methods of treating the data are given in the previous report (June and Reintjes, op. cit.). Methods of age determination and analysis follow those given by June and Roithmayr [2]. The number of samples taken at the various locations during the 1956 season is given in table 2, with comparable data for 1955 shown in parentheses.

Table 2.--Number of samples taken from commercial catches at various locations in 1956

(Data for 1955 are given in parentheses)

Locality	Number of samples					
	Purse-seine		Pound-net and other [1]		Total	
Fernandina Beach, Fla.	106	(27)	--	--	106	(27)
Yonges Island, S. C.	-- [2]	(23)	--	--	--	(23)
Southport, N. C.	29	(34)	--	--	29	(34)
Beaufort, N. C. (Summer)	71	(67)	--	--	71	(67)
North Carolina (Fall)	68	(65)	--	(12)	68	(77)
Reedville, Va.	140	(139)	29	(20)	169	(159)
Lewes, Del.	143	(119)	--	(2)	143	(121)
Port Monmouth, N. J.	147	(138)	--	--	147	(138)
New Jersey - southern Long Island coasts	--	--	79	(22)	79	(22)
Amagansett, N. Y.	129	(92)	--	--	129	(92)
Gloucester, Mass.	52	(23)	--	--	52	(23)
Portland, Me.	11	(28)	--	--	11	(28)
Total	906	(755)	10	(54)	1,004	(811)

1/ Includes gill nets and haul seines.
2/ No commercial fishery.

Age Composition

The percentage age composition of the commercial catch as estimated from samples (based on number of fish) from the 1956 Atlantic coast purse-seine catches, together with the calculated number of fish at each age are summarized in table 3. Comparable data for 1955 also are given.

The most striking feature of the age composition in 1956 was the dominance of the 1955 year class (age 1) which accounted for well over one-half of the total purse-seine catch. In calculated number of fish, it contributed an estimated 2.07 billion individuals, or about 3 times as many as that of the previous year class at age 1 in 1955. The potential size of the 1955 year class was suggested during the closing weeks of the 1955 fall fishing season in North Carolina when, at age 0, it produced a catch of over 30,000 tons, and its estimated contribution amounted to over 742 million fish. It appears, therefore, that this is a fairly strong year class.

It is also noted that the 1954 year class contributed a greater number of fish to the catch at age 2 in 1956 (25.99 million) than at age 1 in 1955 (20.68 million). If the 1955 year class follows this same pattern, it could be expected to contribute substantially to the catch in 1957. Age-2 fish (1954 year class) accounted for one-fourth of the total catch in 1956 whereas in the previous year fish of the same age

2/ "Determining Age of Atlantic Menhaden From Their Scales." by Fred C. June and Charles M. Roithmayr. U. S. Fish and Wildlife Service, Fish. Bull. 171, vol. 60: 323-342.

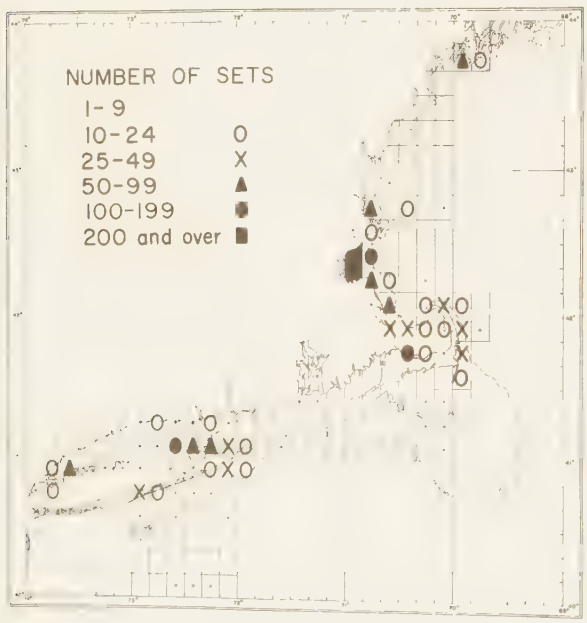

Figure 4.--Distribution of purse-seine sets in the North Atlantic Area, 1956.

(1953 year class) constituted over one-third of the catch. Also of significance was the continued influence on the catch of the strong 1951 year class (age 5) which furnished 151 million fish in 1956, or about half its contribution at age 4 in 1955. For three successive seasons (1952-54) this year class provided the bulk of the Middle Atlantic catch (June and Reintjes, op. cit.). In addition to its unknown contributions in other areas prior to 1955, it also supported the North Atlantic fishery in 1954 and 1955 and continued to dominate the catch in that area in 1956. This year class was nearly 3 times as numerous in the fall catches off the North Carolina coast in 1956 as in 1955, although fishing effort was much greater in 1956. The impact of this year class on the 1956 catch is perhaps even more evident from the fact that it accounted for over 50 percent of the total tonnage landed in the North Atlantic Area and over 40 percent of that landed in the North Carolina fall fishery. It appears that this year class has now been reduced to a level where it can no longer be expected to make important contributions in the future.

The percentage age composition of samples (based on number of fish) from the purse-seine catches in each major area 1956 is shown in figure 5, and the age composition as estimated for the commercial catch is given in table 4 for 1955 and 1956.

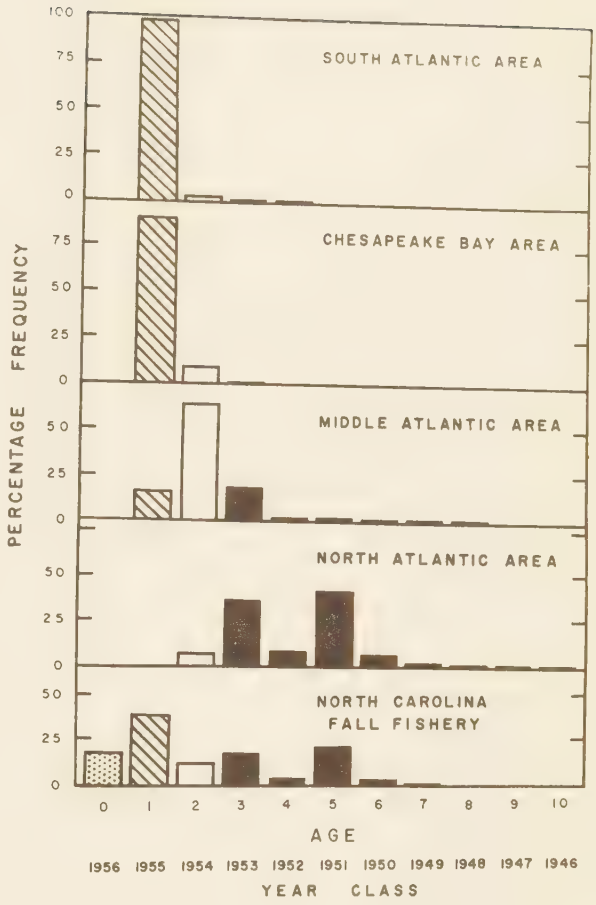

Figure 5.--Age composition of menhaden samples from purse-seine catches, 1956.

Age-1 fish (1955 year class) supported virtually the entire summer fishery in both the South Atlantic and Chesapeake Bay Areas in 1956, whereas in the previous year, age-2 fish (1953 year class) were much more numerous in the catches in both areas, particularly in Chesapeake Bay. Although the 1954 year class (age 2) was poorly represented in both areas in 1956, it occurred in abundance in the Middle Atlantic where it accounted for almost two-thirds of the catch. The 1953 (age 3) and 1955 (age 1) year classes also made important contributions to the catches in the Middle Atlantic Area. Older year classes were largely absent from the catches in this area through the summer, but in late September substantial bodies of large fish moved into southern Long Island waters, and during the

Table 3.--Age composition of samples from purse-seine catches, 1955-56

Year and number of fish	Age								
	0	1	2	3	4	5	6	7	8-10
1955:									
Millions	761.01	636.86	1,053.47	268.87	308.21	37.95	10.75	1.88	0.59
Percent	24.71	20.68	34.21	8.73	10.01	1.23	0.35	0.06	0.02
1956:									
Millions	36.37	2,072.95	941.71	348.42	45.60	151.49	24.38	4.47	0.88
Percent	1.00	57.16	25.97	9.61	1.26	4.18	0.67	0.12	0.02

final weeks of the season, the 1951 year class (age 5) along accounted for nearly one-half of the catch in numbers and over three-fourths of the catch by weight. In the previous year, at age 4, the 1951 year class contributed to the catches in the area through the entire season.

The North Atlantic catch in 1956 consisted primarily of the 1951 (age 5) and 1953 (age 3) year classes, with the 1951 year class dominating. Age-2 fish (1954 year class) were encountered in northern waters in greater numbers than in the previous two seasons; however, the significance of this finding is not yet known. There is a striking similarity between the relative proportions of fish of age 3 through 6 in the summer catch in North Atlantic waters and in the fall catch in North Carolina, the contribution of individual age groups in the fall catch being roughly one-half that in the northern summer catch. Among the younger age groups represented in the North Carolina fall fishery, the 1955 year class (age 1) was most important, accounting for about one-fourth of the total catch. The contribution of age-0 fish (1956 year class) was considerably less in 1956 than in the previous year. Furthermore these small fish did not appear on the North Carolina grounds in appreciable numbers until early January. Whether their reduced number in the fall fishery presages a poor year class is not

Table 4.--Age composition of samples from purse-seine catches, by area, 1955-56

(Numerically dominant year class underscored)

Area, year and number of fish	Age									
	0	1	2	3	4	5	6	7	8	9-10
South Atlantic:										
1955:										
Millions . . .	6.51	255.20	105.74	13.01	10.83	-	-	-	-	-
Percent . . .	1.66	65.22	27.02	3.32	2.77	-	-	-	-	-
1956:										
Millions . . .	-	1,147.88	10.91	0.63	0.23	0.02	-	-	-	-
Percent . . .	-	98.98	0.94	0.05	0.02	-	-	-	-	-
Chesapeake Bay:										
1955:										
Millions . . .	12.18	334.24	382.92	11.52	5.17	0.43	-	-	-	-
Percent . . .	1.63	44.77	51.30	1.54	0.69	0.06	-	-	-	-
1956:										
Millions . . .	-	674.37	66.90	0.49	-	-	-	-	-	-
Percent . . .	-	90.91	9.02	0.07	-	-	-	-	-	-
Middle Atlantic:										
1955:										
Millions . . .	-	16.66	513.31	312.26	160.40	12.90	2.34	0.96	0.12	-
Percent . . .	-	1.81	55.79	23.18	17.43	1.40	0.26	0.10	0.01	-
1956:										
Millions . . .	-	190.28	823.35	232.82	18.60	18.19	3.31	0.71	0.13	-
Percent . . .	-	14.78	63.96	18.08	1.44	1.41	0.26	0.06	0.01	-
North Atlantic:										
1955:										
Millions . . .	-	-	0.42	23.76	115.10	21.88	7.93	0.92	0.29	0.08
Percent . . .	-	-	0.25	13.94	67.55	12.84	4.65	0.54	0.17	0.05
1956:										
Millions . . .	-	-	13.58	77.00	17.41	86.78	13.59	2.73	0.59	0.16
Percent . . .	-	-	6.41	36.35	8.22	40.96	6.42	1.29	0.28	0.08
North Carolina fall fishery:										
1955:										
Millions . . .	742.32	30.76	51.08	7.32	16.71	2.74	0.39	-	0.10	-
Percent . . .	87.19	3.61	6.00	0.86	1.96	0.32	0.04	-	0.01	-
1956:										
Millions . . .	36.37	60.42	26.97	37.48	9.36	46.50	7.48	1.03	-	-
Percent . . .	16.12	26.79	11.95	16.61	4.15	20.61	3.31	0.46	-	-

yet known.

The age distributions in samples from the 1956 spring (April and May) pound-net catches in Chesapeake and Raritan-Lower New York Bays (including the northern New Jersey coast) are summarized in table 5. The 1954 year class (age 2) dominated the Chesapeake Bay spring pound-net catch, although the 1955 year class (age 1) was almost equally represented. Older year classes also occurred in the pound-net samples, although largely absent from the summer purse-seine samples. In the New Jersey-New York area, the 1951 year class (age 5) dominated the catch and was followed in importance by the 1953 (age 3), and 1952 (age 4) year classes respectively.

Length and Weight Composition

Lengths and weights of fish at each age by area along the Atlantic coast in 1956 are given in appendix tables 1-14. The general features of the length composition of the purse-seine catches in each major area are illustrated in figure 6, with comparable data for 1955 also shown.

The ranges in length distribution in the various areas were similar in both years, but there was a marked diversity in the major length groups which contributed to the catch in the individual areas in the two seasons. With the exception of those landed in the North Atlantic, the 1956 summer catches were comprised of smaller length groups of fish than in the previous year. The smallest fish were encountered in the South Atlantic, where they ranged between 115 and 235 mm., with a mode at 162 mm. In Chesapeake Bay, lengths ranged between 135 and 290 mm., with a dominant mode at 192 mm. The curve for the Middle Atlantic shows the greatest spread in length among the summer catches (150 to 355 mm.), with two prominent

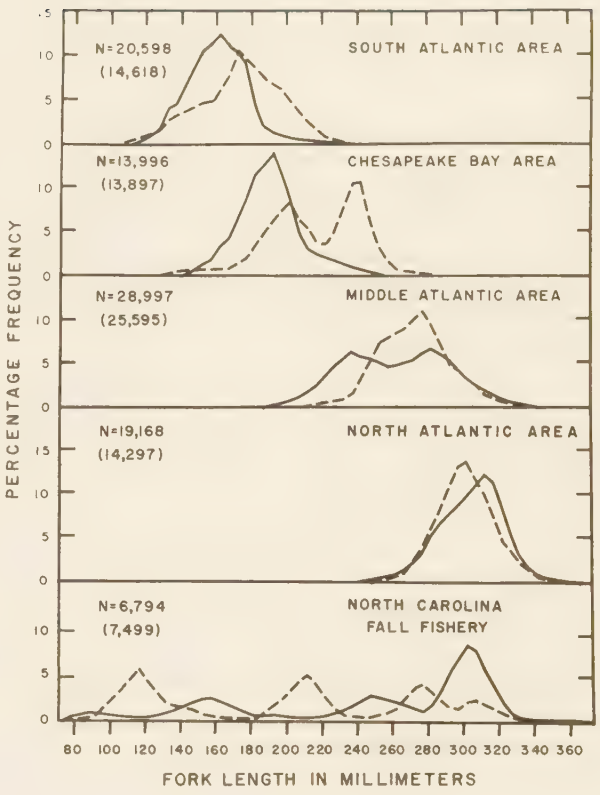

Figure 6.--Length composition of samples from purse-seine catches, 1955-56. (Dashed line, 1955; solid line, 1956.)

size groups at 237 mm. and 282 mm. In the North Atlantic, lengths ranged from 247 to 395 mm., and although the curve is asymmetric, a dominant mode occurs at 312 mm.

Length composition of the 1956 North Carolina fall fishery (bottom panel fig. 6)

Table 5.--Age composition (in percent) of samples from spring pound-net catches, 1956

Locality	Age									
	0	1	2	3	4	5	6	7	8	9-12
Chesapeake Bay	-	47.43	52.88	5.76	0.78	2.62	0.26	-	-	0.26
Raritan-Lower New York Bays	-	-	2.21	16.48	10.68	46.91	15.87	5.19	1.52	1.15

Table 6.--Mean fork length and weight of fish at each age in samples from purse-seine catches, by area, 1955-56.

(Numerically dominant year class underscored)

FORK LENGTH (mm.)

Area and year	Age										
	0	1	2	3	4	5	6	7	8	9	10
South Atlantic:											
1955	128	168	195	208	212	-	-	-	-	-	-
1956	-	159	198	214	224	234					
Chesapeake Bay:											
1955	152	199	236	244	251	242	-	-	-	-	-
1956	-	187	222	293	-	-	-	-	-	-	-
Middle Atlantic:											
1955	-	228	259	279	290	300	314	333	310	-	-
1956	-	221	252	286	302	311	317	321	332	-	-
North Atlantic:											
1955	-	-	277	287	301	316	323	330	336	347	344
1956	-	-	277	290	307	315	322	328	336	340	-
North Carolina fall fishery:											
1955	123	209	259	282	304	317	321	-	338	-	-
1956	118	182	262	298	308	312	318	325	-	-	-

WEIGHT (g.)

Area and year	Age										
	0	1	2	3	4	5	6	7	8	9	10
South Atlantic:											
1955	35	82	125	155	157	-	-	-	-	-	-
1956	-	67	134	176	217	224	-	-	-	-	-
Chesapeake Bay:											
1955	60	142	222	262	278	235	-	-	-	-	-
1956	-	118	196	388	-	-	-	-	-	-	-
Middle Atlantic											
1955	-	225	317	404	457	505	596	712	543	-	-
1956	-	206	305	448	522	582	629	643	688	-	-
North Atlantic											
1955	-	-	401	426	494	589	641	691	732	760	774
1956	-	-	395	444	521	565	615	658	725	766	-
North Carolina fall fishery:											
1955	31	166	356	460	566	648	690	-	806	-	-
1956	27	116	346	516	563	582	642	643	-	-	-

shows several prominant size groups. The smallest fish ranged from about 70 to 125 mm., with a mode at 87 mm. A second peak occurs 157 mm., followed by prominent peaks at 247 and 302 mm. As in the previous year, several of the major size groups which contributed to the summer catches north of Cape Hatteras were well represented in the North Carolina fall fishery. It appears that the variation in the relative contribution of the various size (and age) groups to the North Carolina fall catch is due partly to the availability of the fish and partly to size selectivity on the part of the fishermen. Adverse weather often interrupts fishing during the period when certain size groups are passing through the area, hence these may not be represented in the catch in proportion to their actual abundance. Furthermore, as bodies of larger, heavier fish appear on the grounds, groups of smaller fish already present in the area often are ignored, even though they still may be abundant and within range of the fishing fleet.

Comparison of the average lengths and weights of fish at each age by area in 1955 and 1956 is made in table 6 (See Appendix tables 15-21). The dominant year class in each area is underscored. The data show that fish of the dominant year class which contributed to the catch in each area, without exception, were shorter and lighter in 1956 than in the previous year. Slight irregularities in the average length and weight pattern result, in part, from the comparatively small numbers of fish represented in the several age groups. Also, certain age groups appeared in the samples at varying times during the season in both years and hence are not strictly comparable. Whether the decrease in size of the dominant age groups in 1956 was the result of environmental conditions, including food production, is unknown. It is possible that the greater abundance of fish on the summer grounds in 1956 may have limited the amount of food available to individual fish, thus resulting in an apparent decrease growth rate.

Data for both years show that fish of the same age were largest and heaviest at the northern end of the range and smallest and lightest at the southern end. Also, females were larger and heavier at older ages than the males, and these differences were greatest in northern waters. Varying sex ratios between years among the older age groups (age 4 and older) also affect the average lengths and weights given in table 6; however, this is of no significance among the younger age groups.

SUMMARY

1. The 1956 catch of Atlantic menhaden (Brevoortia tyrannus) was 766,000 tons, of which 740,000 tons were caught by purse seines. Record catches occurred in the Middle Atlantic and North Atlantic Areas.

2. Apparent abundance, as measured by the catch per purse-seine set, was lowest in Chesapeake Bay (13.9 tons) and highest in the North Atlantic Area (35.2 tons).

3. The most productive fishing grounds (200 sets and over) were located (1) off Fernandina Beach, Fla.; (2) off Capes Fear and Lookout, N. C.; (3) in lower Chesapeake Bay; (4) along the coasts of Virginia, Maryland, Delaware, New Jersey, and the western end of Long Island; and (5) Massachusetts Bay.

4. Age composition of samples from the catches indicated that the 1955 year class (age-1 fish) dominated the fishery in 1956, contributing an estimated 2.07 billion fish. Following in order of importance, the 1954 (age 2), 1953 (age 3), and 1951 (age 5) year classes also made substantial contributions to the catches. The 1955 year class dominated in the South Atlantic and Chesapeake summer catches and the North Carolina fall catch; the 1954 year class (age-2 fish) dominated in the Middle Atlantic Area; and the 1951 year class (age-5 fish) dominated in the North Atlantic Area.

5. Length composition of the catches showed that smaller length groups were encountered in most areas in 1956 as compared with the previous year. Also, average weights and lengths of fish in the dominant year class in the individual areas were smaller in 1956.

Appendix Table 1.--Length frequency distributions in samples from purse-seine catches, South Atlantic Area, excluding the North Carolina fall fishery, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Fork length (mm.)	Age															Total
	1			2			3			4			5			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
115-119	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	3
120-124	12	4	17	-	-	-	-	-	-	-	-	-	-	-	-	17
125-129	35	23	60	-	-	-	-	-	-	-	-	-	-	-	-	60
130-134	68	73	144	-	-	-	-	-	-	-	-	-	-	-	-	144
135-139	83	89	174	-	-	-	-	-	-	-	-	-	-	-	-	174
140-144	150	133	283	-	-	-	-	-	-	-	-	-	-	-	-	283
145-149	174	152	326	1	-	1	-	-	-	-	-	-	-	-	-	327
150-154	190	189	380	-	-	-	-	-	-	-	-	-	-	-	-	380
155-159	221	235	459	-	-	-	-	-	-	-	-	-	-	-	-	459
160-164	285	271	557	-	1	1	-	-	-	-	-	-	-	-	-	558
165-169	200	251	451	-	-	-	-	-	-	-	-	-	-	-	-	451
170-174	226	253	482	1	-	1	-	-	-	-	-	-	-	-	-	483
175-179	108	191	299	-	2	2	-	-	-	-	-	-	-	-	-	301
180-184	58	114	172	1	5	6	-	-	-	-	-	-	-	-	-	178
185-189	30	46	76	7	5	12	-	-	-	-	-	-	-	-	-	88
190-194	13	19	32	17	8	25	-	-	-	-	-	-	-	-	-	57
195-199	3	5	8	3	3	6	1	-	1	-	-	-	-	-	-	15
200-204	3	3	6	4	8	12	-	-	-	-	-	-	-	-	-	18
205-209	4	1	5	1	4	5	1	2	3	-	-	-	-	-	-	13
210-214	-	3	3	3	7	10	-	-	-	-	-	-	-	-	-	13
215-219	-	1	1	3	2	5	-	1	1	-	-	-	-	-	-	7
220-224	-	1	1	1	3	4	-	-	-	-	1	1	-	-	-	6
225-229	-	-	-	-	2	2	-	1	1	-	-	-	-	-	-	3
230-234	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1
235-239	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
Total . .	1865	2058	3939	42	50	92	2	5	7	-	1	1	-	1	1	4040

Appendix Table 2.--Length frequency distributions in samples from spring pound-net catches, Chesapeake Bay Area, 1956

(M = male, F = female, T = total)

Fork length (mm.)	Age																											Total
	1			2			3			4			5			6			7			8			9			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
125-129	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
130-134	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
135-139	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
140-144	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
145-149	4	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
150-154	5	7	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
155-159	9	14	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
160-164	20	9	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
165-169	7	6	13	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
170-174	6	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
175-179	8	10	18	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
180-184	5	5	10	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
185-189	2	2	4	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
190-194	1	2	3	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
195-199	-	2	2	2	4	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
200-204	1	1	2	15	8	23	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
205-209	-	1	1	12	10	22	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
210-214	-	-	-	24	13	37	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
215-219	-	-	-	16	21	37	3	1	4	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
220-224	-	-	-	13	11	24	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
225-229	-	-	-	9	15	24	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
230-234	-	-	-	2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
235-239	-	-	-	2	-	2	1	2	3	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	7
240-244	-	-	-	2	3	5	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
245-249	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
250-254	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
255-259	-	-	-	-	-	-	1	1	2	-	1	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	4
260-264	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
265-269	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270-274	-	-	-	-	-	-	1	-	1	-	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	3
275-279	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
280-284	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	2
285-289	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
290-294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295-299	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
300-304	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	1	2
305-309	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Total . .	73	70	143	105	96	201	11	10	21	1	2	3	6	4	10	-	1	1	-	-	-	-	-	-	-	1	1	380

Appendix Table 3.--Length frequency distributions in samples from purse-seine catches, Chesapeake Bay Area, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Fork length (mm.)	Age									Total
	1			2			3			
	M	F	T	M	F	T	M	F	T	
145-149	7	6	13	-	-	-	-	-	-	13
150-154	6	12	18	-	-	-	-	-	-	18
155-159	18	12	30	-	-	-	-	-	-	30
160-164	44	43	88	-	-	-	-	-	-	88
165-169	55	35	90	-	-	-	-	-	-	90
170-174	83	95	180	-	-	-	-	-	-	180
175-179	78	78	158	-	-	-	-	-	-	158
180-184	154	147	302	-	1	1	-	-	-	303
185-189	135	182	323	2	-	2	-	-	-	325
190-194	156	184	341	1	2	3	-	-	-	344
195-199	152	188	342	2	2	4	-	-	-	346
200-204	108	136	244	4	6	10	-	-	-	254
205-209	46	37	83	6	7	13	-	-	-	96
210-214	23	17	40	11	12	23	-	-	-	63
215-219	7	7	14	21	21	42	-	-	-	56
220-224	3	2	5	22	19	42	-	-	-	47
225-229	1	2	3	18	25	43	-	-	-	46
230-234	1	2	3	15	19	34	-	-	-	37
235-239	1	2	3	4	11	15	-	-	-	18
240-244	2	1	3	5	4	9	-	-	-	12
245-249	-	-	-	3	-	3	-	-	-	3
250-254	-	2	2	4	1	5	-	-	-	7
255-259					1	1				1
260-264					1	1				1
265-269	-	-	-	-	-	-	-	-	-	-
270-274	-	-	-	-	-	-	-	-	-	-
275-279	-	-	-	-	-	-	-	-	-	-
280-284	-	-	-	-	-	-	-	-	-	-
285-289	-	-	-	-	-	-	-	-	-	-
290-294	-	-	-	-	-	-	-	1	1	1
Total . .	1080	1190	2285	118	132	251	-	1	1	2537

Appendix Table 4.--Length frequency distributions in samples from spring pound-net catches, Middle Atlantic Area, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Fork length (mm.)	Age																																	Total
	2			3			4			5			6			7			8			9			10			11			12			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
200-204	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
205-209	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210-214	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
215-219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220-224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225-229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230-234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235-239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240-244	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
245-249	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
250-254	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
255-259	1	1	2	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
260-264	5	2	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
265-269	2	2	4	8	2	10	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
270-274	3	2	5	14	1	15	2	-	2	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
275-279	3	2	5	16	8	24	-	2	2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
280-284	-	2	2	14	19	33	2	-	2	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41
285-289	-	-	-	16	23	39	3	4	7	6	1	7	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
290-294	-	1	1	14	29	43	8	3	11	19	2	21	1	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78
295-299	-	-	-	3	25	28	10	3	13	39	9	48	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90
300-304	-	-	-	3	8	11	14	13	27	65	17	82	6	-	6	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	127
305-309	-	-	-	4	2	6	8	25	33	80	45	125	7	3	10	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176
310-314	-	-	-	2	-	2	4	14	18	64	72	136	15	8	23	4	2	6	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	186
315-319	-	-	-	-	-	-	1	14	15	30	75	105	18	19	37	-	6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	163
320-324	-	-	-	-	-	-	1	7	8	10	52	62	16	18	34	5	3	8	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	114
325-329	-	-	-	-	-	-	-	2	2	4	23	27	7	11	18	4	7	11	4	-	4	-	-	-	1	-	1	-	-	-	-	-	-	63
330-334	-	-	-	-	-	-	-	-	-	1	6	7	7	15	22	2	5	7	3	2	5	1	0	1	1	-	1	-	-	-	1	-	1	44
335-339	-	-	-	-	-	-	-	-	-	1	5	6	2	15	17	3	9	12	1	-	1	2	2	4	-	-	-	-	-	-	-	-	-	40
340-344	-	-	-	-	-	-	-	-	-	-	3	3	-	3	3	3	8	11	-	3	3	-	1	1	-	-	-	-	-	-	-	-	-	21
345-349	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	1	1	2	-	2	2	1	2	3	-	-	-	-	-	-	-	-	-	10
350-354	-	-	-	-	-	-	-	-	-	-	1	1	-	3	3	-	3	3	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	9
355-359	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	-	1	1	-	-	-	-	-	-	3
360-364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1
Total . .	17	12	29	97	119	216	53	87	140	321	317	638	81	98	179	24	47	71	9	11	20	4	7	11	2	1	3	-	-	-	1	-	1	1308

Appendix Table 5.--Length frequency distributions in samples from purse-seine catches, Middle Atlantic Area, 1956

(M - male, F - female, T - total, including specimens for which sex was not determined)

Fork Length (mm.)	Age																							Total
	1			2			3			4			5			6			7			8			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
150-154	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
155-159	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
160-164	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
165-169	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
170-174	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
175-179	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
180-184	3	2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
185-189	1	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
190-194	3	4	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
195-199	11	4	15	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
200-204	14	7	22	10	5	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
205-209	26	18	44	8	3	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
210-214	27	28	55	19	13	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88
215-219	20	26	46	47	24	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118
220-224	27	26	53	63	60	123	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	177
225-229	28	32	61	86	83	170	2	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	237
230-234	22	20	42	142	130	273	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	319
235-239	23	10	33	128	140	270	4	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	311
240-244	11	20	31	141	140	281	8	6	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	326
245-249	8	7	16	135	114	250	4	4	9	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	276
250-254	-	5	5	142	134	276	7	3	10	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	292
255-259	1	2	3	108	110	219	8	15	23	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	247
260-264	-	1	1	104	117	222	13	16	30	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	254
265-269	1	2	3	87	96	183	33	21	54	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	241
270-274	1	-	1	89	91	180	68	28	96	2	-	2	2	-	2	-	-	-	-	-	-	-	-	-	281
275-279	-	-	-	63	79	142	102	56	158	2	-	2	-	1	1	-	-	-	-	-	-	-	-	-	303
280-284	1	-	1	52	83	135	157	86	243	5	4	9	1	-	1	-	-	-	-	-	-	-	-	-	389
285-289	-	-	-	40	59	99	132	102	234	5	2	7	2	-	2	-	-	-	-	-	-	-	-	-	342
290-294	-	-	-	21	35	56	86	146	232	10	8	18	5	1	6	-	-	-	-	-	-	-	-	-	312
295-299	-	-	-	13	31	44	72	111	183	12	8	20	11	4	15	-	-	-	-	-	-	-	-	-	262
300-304	-	-	-	6	13	19	24	87	111	9	6	15	20	6	26	3	1	4	-	-	-	-	-	-	175
305-309	-	-	-	-	2	2	11	65	76	14	7	21	46	17	63	3	3	6	-	-	-	-	-	-	168
310-314	-	-	-	-	1	1	4	24	28	8	13	21	32	28	60	3	5	8	1	1	2	-	-	-	120
315-319	-	-	-	-	-	-	1	9	10	9	4	13	20	32	52	6	2	8	-	-	-	-	-	-	83
320-324	-	-	-	-	1	1	-	4	4	2	10	12	7	29	36	2	4	6	-	1	1	1	-	1	61
325-329	-	-	-	-	-	-	-	-	-	-	3	3	1	9	10	-	2	2	-	1	1	-	-	-	16
330-334	-	-	-	-	1	1	-	-	-	-	1	1	1	2	3	-	2	2	-	1	1	-	-	-	8
335-339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340-344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1
Total . .	231	222	460	1505	1565	3079	738	793	1534	81	68	149	149	129	278	17	19	36	1	4	5	1	1	2	5543

Appendix Table 6.--Length frequency distributions in samples from purse-seine catches, North Atlantic Area, 1956

(M - male, F - female, T - total, including specimens for which sex was not determined)

Fork length (mm.)	Age																							Total
	2			3			4			5			6			7			8			9			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
230-234	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
235-239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240-244	2	-	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
245-249	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
250-254	7	1	8	4	1	5	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
255-259	6	3	9	1	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
260-264	7	3	10	4	3	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
265-269	10	6	16	18	10	28	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
270-274	12	11	23	25	9	34	4	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61
275-279	13	10	23	60	16	77	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	102
280-284	16	15	31	91	41	132	5	2	7	4	-	4	-	-	-	-	-	-	-	-	-	-	-	-	174
285-289	6	17	23	123	83	206	8	-	8	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	240
290-294	7	7	14	102	146	249	10	6	16	24	4	28	-	-	-	-	-	-	-	-	-	-	-	-	307
295-299	2	8	10	70	120	190	19	7	26	52	6	58	6	1	7	-	-	-	-	-	-	-	-	-	291
300-304	2	5	7	26	113	139	30	10	40	133	28	161	10	1	11	1	-	1	-	-	-	-	-	-	359
305-309	-	-	-	5	46	51	37	25	62	169	73	242	26	2	28	1	-	1	-	-	-	-	-	-	384
310-314	-	-	-	-	21	21	23	42	65	175	187	362	14	12	26	4	-	4	-	-	-	-	-	-	478
315-319	-	-	-	-	7	7	5	36	41	124	260	384	33	27	60	6	4	10	2	-	2	-	-	-	504
320-324	-	-	-	-	2	2	3	24	27	46	202	248	16	30	46	6	4	10	1	-	1	-	-	-	334
325-329	-	-	-	-	1	1	-	8	8	14	122	136	19	35	54	4	3	7	1	-	1	1	-	1	208
330-334	-	-	-	-	-	-	-	3	3	8	66	74	6	17	23	4	8	12	1	1	2	1	-	1	115
335-339	-	-	-	-	-	-	-	-	-	2	20	22	4	20	24	1	5	6	1	2	3	-	-	-	55
340-344	-	-	-	-	-	-	-	-	-	-	8	8	2	10	12	-	5	5	1	1	2	-	-	-	27
345-349	-	-	-	-	-	-	-	-	-	-	2	2	-	5	5	-	2	2	-	2	2	-	1	1	12
350-354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	2	-	1	1	4
355-359	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	2
360-364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	2
Total . .	92	87	179	530	620	1152	146	167	313	754	979	1733	136	161	297	27	34	61	8	7	15	2	2	4	3754

Appendix Table 7.--Length frequency distributions in samples from purse-seine catches, North Carolina fall fishery, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Fork Length (mm.)	Age																							Total
	0			1			2			3			4			5			6			7			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
75-79	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
80-84	5	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
85-89	7	2	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
90-94	4	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
95-99	4	10	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
100-104	2	7	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
105-109	4	3	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
110-114	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
115-119	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
120-124	1	4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
125-129	6	4	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
130-134	2	7	9	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
135-139	8	6	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
140-144	4	6	10	4	5	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
145-149	5	4	9	6	4	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
150-154	3	2	5	17	13	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
155-159	1	1	2	11	24	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
160-164	1	1	2	16	11	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
165-169	-	-	-	11	24	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
170-174	-	-	-	20	18	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38
175-179	-	-	-	5	11	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
180-184	-	-	-	6	5	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
185-189	-	-	-	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
190-194	-	-	-	3	6	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
195-199	-	-	-	4	1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
200-204	-	-	-	-	4	4	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
205-209	-	-	-	5	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
210-214	-	-	-	3	2	5	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
215-219	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
220-224	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1

Appendix Table 7.--Length frequency distributions in samples from purse-seine catches, North Carolina fall fishery, 1956 (continued)

(M - male, F - female, T - total, including specimens for which sex was not determined)

Fork length (mm.)	Age																							Total
	0			1			2			3			4			5			6			7			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
225-229	-	-	-	1	1	2	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
230-234	-	-	-	6	3	9	3	3	6	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	16
235-239	-	-	-	7	4	11	2	4	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
240-244	-	-	-	10	3	13	9	5	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
245-249	-	-	-	4	6	10	18	1	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
250-254	-	-	-	4	2	6	17	7	24	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-	32
255-259	-	-	-	-	-	-	18	13	31	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	33
260-264	-	-	-	-	1	1	14	14	28	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	35
265-269	-	-	-	-	-	-	10	12	22	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	24
270-274	-	-	-	1	-	1	11	13	24	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	28
275-279	-	-	-	-	-	-	2	11	13	1	1	2	-	1	1	-	-	-	-	-	-	-	-	-	16
280-284	-	-	-	-	-	-	3	5	8	4	3	7	-	-	-	1	1	2	-	-	-	-	-	-	17
285-289	-	-	-	-	-	-	3	5	8	12	1	13	-	-	-	1	-	1	-	-	-	-	-	-	22
290-294	-	-	-	-	-	-	3	5	8	27	10	37	2	-	2	4	1	5	1	-	1	-	-	-	53
295-299	-	-	-	-	-	-	-	4	4	29	20	49	9	3	12	16	2	18	-	-	-	-	-	-	83
300-304	-	-	-	-	-	-	1	1	2	26	37	63	2	4	6	32	1	33	1	-	1	-	-	-	105
305-309	-	-	-	-	-	-	1	3	4	5	34	39	7	6	13	45	14	59	5	1	6	-	-	-	121
310-314	-	-	-	-	-	-	-	-	-	1	26	27	4	6	10	35	25	60	2	6	8	-	-	-	105
315-319	-	-	-	-	-	-	-	-	-	-	5	5	4	7	11	18	42	60	6	10	16	1	1	2	94
320-324	-	-	-	-	-	-	-	-	-	-	3	3	-	4	4	2	41	43	2	1	3	-	-	-	53
325-329	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	17	19	-	4	4	3	1	4	29
330-334	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-	4	4	-	1	1	8
335-339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	-	3	3	-	-	-	6
340-344	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
345-349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
Total ..	64	61	127	147	157	306	118	107	225	114	146	260	29	36	65	157	148	305	17	30	47	4	3	7	1342

Appendix Table 8.--Weight frequency distributions in samples from purse-seine catches South Atlantic Area, excluding the North Carolina fall fishery, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age															Total
	1			2			3			4			5			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
20-29	22	9	32	-	-	-	-	-	-	-	-	-	-	-	-	32
30-39	154	140	298	-	-	-	-	-	-	-	-	-	-	-	-	298
40-49	265	242	510	-	-	-	-	-	-	-	-	-	-	-	-	510
50-59	358	317	678	1	-	1	-	-	-	-	-	-	-	-	-	679
60-69	357	365	724	-	-	-	-	-	-	-	-	-	-	-	-	724
70-79	318	354	673	-	1	1	-	-	-	-	-	-	-	-	-	674
80-89	201	278	480	1	2	3	-	-	-	-	-	-	-	-	-	483
90-99	116	208	325	1	3	4	-	-	-	-	-	-	-	-	-	329
100-109	48	78	126	4	1	5	-	-	-	-	-	-	-	-	-	131
110-119	6	36	42	14	10	24	1	-	1	-	-	-	-	-	-	67
120-129	12	15	27	10	7	17	-	-	-	-	-	-	-	-	-	44
130-139	4	5	9	3	2	5	-	-	-	-	-	-	-	-	-	14
140-149	1	2	3	2	3	5	-	-	-	-	-	-	-	-	-	8
150-159	3	1	4	1	6	7	1	1	2	-	-	-	-	-	-	13
160-169	-	4	4	-	4	4	-	1	1	-	-	-	-	-	-	9
170-179	-	1	1	1	2	3	-	1	1	-	-	-	-	-	-	5
180-189	-	-	-	1	5	6	-	-	-	-	-	-	-	-	-	6
190-199	-	1	1	3	1	4	-	-	-	-	-	-	-	-	-	5
200-209	-	1	1	-	2	2	-	-	-	-	-	-	-	-	-	3
210-219	-	-	-	-	1	1	-	1	1	-	1	1	-	-	-	3
220-229	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1
230-239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240-249	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
Total . .	1865	2057	3938	42	50	92	2	5	7	-	1	1	-	1	1	4039

Appendix Table 9.--Weight frequency distributions in samples from purse-seine catches, Chesapeake Bay Area, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age									Total
	1			2			3			
	M	F	T	M	F	T	M	F	T	
40-49	2	-	2	-	-	-	-	-	-	2
50-59	5	7	12	-	-	-	-	-	-	12
60-69	25	31	57	-	-	-	-	-	-	57
70-79	65	47	112	-	-	-	-	-	-	112
80-89	101	97	199	-	-	-	-	-	-	199
90-99	98	112	214	-	-	-	-	-	-	214
100-109	149	141	292	-	1	1	-	-	-	293
110-119	153	192	348	1	-	1	-	-	-	349
120-129	148	168	318	1	2	3	-	-	-	321
130-139	108	148	257	2	3	5	-	-	-	262
140-149	94	116	211	2	2	4	-	-	-	215
150-159	68	70	138	5	8	13	-	-	-	151
160-169	36	29	65	9	11	20	-	-	-	85
170-179	10	12	22	16	16	32	-	-	-	54
180-189	6	8	14	17	16	34	-	-	-	48
190-199	4	5	9	21	18	39	-	-	-	48
200-209	1	-	1	16	16	32	-	-	-	33
210-219	-	1	1	7	21	28	-	-	-	29
220-229	1	-	1	7	8	15	-	-	-	16
230-239	-	1	1	3	3	6	-	-	-	7
240-249	-	-	-	2	3	5	-	-	-	5
250-259	1	-	1	2	-	2	-	-	-	3
260-269	-	1	1	-	1	1	-	-	-	2
270-279	1	1	2	-	-	-	-	-	-	2
280-289	-	1	1	1	-	1	-	-	-	2
290-299	-	1	1	1	-	1	-	-	-	2
300-309	1	-	1	-	-	-	-	-	-	1
310-319	2	-	2	1	-	1	-	-	-	3
320-329	1	-	1	1	-	1	-	-	-	2
330-339	-	-	-	2	-	2	-	-	-	2
340-349	-	-	-	1	-	1	-	-	-	1
350-359	-	1	1	-	1	1	-	-	-	2
360-369	-	-	-	-	-	-	-	-	-	-
370-379	-	-	-	-	1	1	-	-	-	1
380-389	-	-	-	-	-	-	-	1	1	1
390-399	-	-	-	-	1	1	-	-	-	1
Total . .	1080	1190	2285	118	132	251	-	1	1	2537

Appendix Table 10.--Weight frequency distributions in samples from spring pound-net catches, Chesapeake Bay Area, 1956

(M = male, F = female, T = total)

Weight (g.)	Age																									Total
	1			2			3			4			5			6			7			8			9			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
30-39	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
40-49	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
50-59	9	7	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
60-69	16	15	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
70-79	17	18	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
80-89	9	5	14	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
90-99	10	10	20	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
100-109	6	5	11	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
110-119	1	1	2	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
120-129	2	3	5	3	4	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
130-139	-	2	2	10	7	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
140-149	-	1	1	12	10	22	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
150-159	-	1	1	12	10	22	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
160-169	-	-	-	23	19	42	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45
170-179	-	-	-	14	11	25	1	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
180-189	-	-	-	11	11	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
190-199	-	-	-	5	9	14	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
200-209	-	-	-	4	4	8	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	10
210-219	-	-	-	2	3	5	1	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
220-229	-	-	-	1	3	4	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
230-239	-	-	-	1	1	2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
240-249	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250-259	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

Appendix Table 10.--Weight frequency distributions in samples from spring pound-net catches, Chesapeake Bay Area, 1956 (continued)

(M = male, F = female, T = total)

Weight (g.)	Age																										Total
	1			2			3			4			5			6			7			8			9			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
260-269	-	-	-	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
270-279	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
280-289	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
290-299	-	-	-	-	-	-	1	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2
300-309	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310-319	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
320-329	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
330-339	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340-349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	1
350-359	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
360-369	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
370-379	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
380-389	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
390-399	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
400-409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
410-419	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
420-429	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
430-439	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
440-449	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
450-459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
460-469	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
470-479	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
480-489	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
490-499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-509	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
510-519	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
520-529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1
Total . .	73	70	143	106	96	202	12	9	21	1	2	3	6	4	10	1	-	1	-	-	-	-	-	-	-	1	1	381

Appendix Table 11.--Weight frequency distributions in samples from spring pound-net catches, Middle Atlantic Area, 1956

(M = male, F = female, T = total)

Weight (g.)	Age																															Total
	2			3			4			5			6			7			8			9			10			11			12			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
150-159	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
160-169	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170-179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180-189	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190-199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200-209	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210-219	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220-229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230-239	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
240-249	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250-259	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
260-269	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
270-279	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
280-289	-	1	1	1	1	2	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
290-299	1	-	1	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
300-309	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
310-319	3	1	4	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
320-329	4	1	5	1	1	2	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
330-339	-	2	2	8	2	10	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
340-349	-	1	1	11	1	12	1	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
350-359	3	1	4	8	3	11	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
360-369	2	2	4	8	5	13	2	-	2	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
370-379	-	1	1	11	8	19	-	1	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
380-389	-	-	-	2	3	5	-	-	-	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
390-399	-	-	-	11	11	22	1	-	1	3	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
400-409	-	1	1	4	10	14	4	1	5	5	1	6	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
410-419	-	-	-	5	10	15	2	2	4	12	2	14	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
420-429	-	1	1	6	17	23	5	6	11	15	3	18	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
430-439	-	-	-	3	14	17	7	2	9	20	2	22	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
440-449	-	-	-	2	8	10	4	2	6	22	5	27	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45
450-459	-	-	-	2	10	12	9	8	17	22	5	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56
460-469	-	-	-	2	6	8	3	8	11	36	16	52	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73
470-479	-	-	-	5	4	9	4	6	10	33	12	45	3	1	4	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69
480-489	-	-	-	1	1	2	3	8	11	26	26	52	8	1	9	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
490-499	-	-	-	-	2	2	2	3	5	18	33	51	3	3	6	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	65
500-509	-	-	-	-	1	1	1	7	8	21	13	34	5	4	9	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
510-519	-	-	-	-	-	-	-	5	5	24	25	49	7	6	13	2	-	2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	70
520-529	-	-	-	-	-	-	-	7	7	23	25	48	8	3	11	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
530-539	-	-	-	-	1	1	1	4	5	5	25	30	4	4	8	1	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	47
540-549	-	-	-	-	-	-	1	2	3	13	20	33	7	2	9	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49
550-559	-	-	-	-	-	-	-	6	6	5	20	25	1	6	7	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42

Appendix Table 11.--Weight frequency distributions in samples from spring pound-net catches, Middle Atlantic Area, 1956 (continued)

(M = male, F = female, T = total)

Weight (g.)	Age																															Total
	2			3			4			5			6			7			8			9			10			11			12			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
560-569	-	-	-	-	-	-	1	1	2	5	21	26	6	8	14	-	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	44
570-579	-	-	-	-	-	-	-	2	2	2	14	16	4	9	13	1	-	1	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	35
580-589	-	-	-	-	-	-	-	2	2	1	10	11	3	4	7	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
590-599	-	-	-	-	-	-	-	-	-	1	7	8	7	5	12	2	3	5	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1	27
600-609	-	-	-	-	-	-	-	-	-	1	6	7	-	7	7	2	3	5	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	21
610-619	-	-	-	-	-	-	-	1	1	-	3	3	1	4	5	1	2	3	2	-	2	1	-	1	-	-	-	-	-	-	-	-	-	15
620-629	-	-	-	-	-	-	-	-	-	-	2	2	2	7	9	1	3	4	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-	17
630-639	-	-	-	-	-	-	-	1	1	-	1	1	-	2	2	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
640-649	-	-	-	-	-	-	-	-	-	1	3	4	2	2	4	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
650-659	-	-	-	-	-	-	-	-	-	-	2	2	-	3	3	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
660-669	-	-	-	-	-	-	-	-	-	-	-	-	-	6	6	1	1	2	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	10
670-679	-	-	-	-	-	-	-	-	-	-	3	3	2	2	4	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
680-689	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	2	3	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	5
690-699	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	-	3	3	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	6
700-709	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	2	2	1	3	4	1	1	2	-	-	-	-	-	-	-	-	-	10
710-719	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
720-729	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	1	1	-	1	1	1	2	3	-	-	-	-	-	-	-	-	-	-
730-739	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	2	2	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
740-749	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
750-759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
760-769	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
770-779	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
780-789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
790-799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
800-809	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
810-819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
820-829	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
830-839	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
840-849	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
850-859	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
860-869	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
870-879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
880-889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
890-899	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
900-909	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
910-919	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
920-929	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
930-939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
940-949	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
950-959	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
960-969	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1
Total . .	17	12	29	97	119	216	53	87	140	321	317	638	81	98	179	24	47	71	9	11	20	4	7	11	2	1	3	-	-	-	1	-	1	1308

Appendix Table 12.--Weight frequency distributions in samples from purse-seine catches, Middle Atlantic Area, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age																							Total
	1			2			3			4			5			6			7			8			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
60-69	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
70-79	1	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
80-89	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
90-99	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
100-109	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
110-119	5	3	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
120-129	4	8	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
130-139	8	2	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
140-149	18	8	26	3	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
150-159	15	14	29	8	3	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41
160-169	19	17	36	13	4	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53
170-179	14	19	33	15	12	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61
180-189	19	19	38	52	26	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116
190-199	8	20	29	56	49	105	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	136
200-209	24	14	38	67	62	130	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	170
210-219	11	7	18	64	71	135	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156
220-229	15	12	27	90	91	182	-	4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	214
230-239	10	11	21	67	89	156	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	181
240-249	7	10	17	82	75	159	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	179
250-259	11	11	22	72	78	150	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176
260-269	11	7	18	72	67	141	5	3	9	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	169
270-279	5	7	13	62	62	124	6	2	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	145
280-289	5	7	12	71	46	117	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133
290-299	6	4	10	54	47	101	4	5	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120
300-309	3	8	11	51	45	97	7	9	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	124
310-319	1	1	2	66	54	120	8	3	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	133
320-329	1	2	3	58	61	119	3	8	12	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	135
330-339	1	2	3	59	49	108	11	10	21	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	133
340-349	2	1	3	45	49	94	14	7	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118
350-359	-	-	-	44	50	94	26	13	39	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	134
360-369	1	1	2	40	40	80	45	16	61	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	146
370-379	1	-	1	39	49	88	36	16	52	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	143
380-389	-	2	2	38	44	82	53	18	71	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	158
390-399	-	-	-	32	39	71	61	27	88	1	-	1	3	-	3	-	-	-	-	-	-	-	-	-	163
400-409	-	-	-	29	40	69	37	34	71	2	-	2	3	-	3	-	-	-	-	-	-	-	-	-	145
410-419	1	-	1	27	31	58	55	45	100	5	1	6	-	-	-	-	-	-	-	-	-	-	-	-	165
420-429	-	1	1	20	25	45	48	37	85	-	1	1	1	-	1	-	-	-	-	-	-	-	-	-	133
430-439	-	-	-	20	29	49	45	37	82	1	-	1	-	1	1	-	-	-	-	-	-	-	-	-	133
440-449	-	-	-	13	28	41	30	45	75	7	1	8	1	1	2	-	-	-	-	-	-	-	-	-	126

Appendix Table 12.--Weight frequency distributions in samples from purse-seine catches, Middle Atlantic Area, 1956 (continued)
(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age																								Total
	1			2			3			4			5			6			7			8			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
450-459	-	-	-	21	29	50	17	45	62	3	2	5	3	2	5	-	-	-	-	-	-	-	-	-	122
460-469	-	-	-	14	19	33	25	45	70	2	5	7	1	1	2	-	-	-	-	-	-	-	-	-	112
470-479	-	-	-	11	16	27	21	36	57	5	6	11	3	1	4	1	-	1	-	-	-	-	-	-	100
480-489	-	-	-	6	16	22	29	30	59	5	6	11	4	1	5	-	-	-	-	-	-	-	-	-	97
490-499	-	-	-	6	12	18	21	28	49	3	2	5	6	2	8	-	-	-	-	-	-	-	-	-	80
500-509	-	-	-	5	8	13	19	23	42	1	7	8	5	3	8	-	-	-	-	-	-	-	-	-	71
510-519	-	-	-	2	8	10	15	26	41	4	2	6	12	3	15	2	1	3	-	-	-	-	-	-	75
520-529	-	-	-	2	13	15	20	21	41	3	3	6	6	2	8	-	-	-	-	-	-	-	-	-	70
530-539	-	-	-	3	9	12	17	25	42	3	3	6	5	3	8	-	-	-	-	-	-	-	-	-	68
540-549	-	-	-	2	1	3	7	19	26	1	1	2	8	3	11	1	1	2	-	-	-	-	-	-	44
550-559	-	-	-	2	3	5	5	16	21	4	1	5	12	5	17	1	-	1	-	-	-	-	-	-	49
560-569	-	-	-	2	1	3	10	14	24	1	1	2	7	9	16	1	2	3	1	-	1	-	-	-	49
570-579	-	-	-	-	2	2	3	19	22	3	1	4	6	9	15	-	-	-	-	-	-	-	-	-	43
580-589	-	-	-	-	1	1	7	14	21	2	1	3	15	3	18	3	1	4	-	-	-	-	-	-	47
590-599	-	-	-	-	-	-	3	19	22	3	1	4	3	8	11	1	1	2	-	-	-	-	-	-	39
600-609	-	-	-	-	1	1	5	11	16	4	-	4	8	7	15	2	1	3	-	1	1	-	-	-	40
610-619	-	-	-	-	1	1	1	7	8	3	3	6	8	5	13	1	-	1	-	-	-	1	-	1	30
620-629	-	-	-	-	3	3	3	9	12	2	2	4	6	3	9	1	-	1	-	-	-	-	-	-	29
630-639	-	-	-	-	-	-	2	10	12	1	1	2	7	8	15	1	-	1	-	-	-	-	-	-	30
640-649	-	-	-	-	3	3	-	2	2	-	2	2	6	6	12	-	1	1	-	1	1	-	-	-	21
650-659	-	-	-	-	1	1	1	9	10	-	1	1	3	12	15	-	1	1	-	-	-	-	-	-	28
660-669	-	-	-	-	-	-	1	3	4	1	2	3	3	6	9	1	1	2	-	1	1	-	-	-	19
670-679	-	-	-	-	1	1	-	1	1	1	2	3	-	5	5	-	-	-	-	-	-	-	-	-	10
680-689	-	-	-	-	-	-	-	4	4	1	1	2	1	3	4	-	-	-	-	-	-	-	-	-	10
690-699	-	-	-	-	-	-	-	5	5	-	2	2	-	4	4	-	2	2	-	-	-	-	-	-	13
700-709	-	-	-	-	-	-	-	1	1	-	1	1	-	3	3	1	-	1	-	-	-	-	-	-	6
710-719	-	-	-	-	-	-	-	2	2	-	-	-	-	2	2	-	1	1	-	-	-	-	-	-	5
720-729	-	-	-	-	-	-	-	-	-	-	2	2	1	4	5	-	1	1	-	-	-	-	-	-	8
730-739	-	-	-	-	-	-	-	-	-	-	1	1	1	-	1	-	1	1	-	-	-	-	-	-	3
740-749	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	1	-	-	-	2
750-759	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	-	1	1	3
760-769	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	-	-	-	2
770-779	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1
780-789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
790-799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
800-809	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
810-819	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
820-829	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
830-839	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
840-849	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
Total . .	231	222	460	1505	1565	3079	738	793	1534	81	68	149	149	129	278	17	19	36	1	4	5	1	1	2	5543

Appendix Table 13.--Weight frequency distributions in samples from purse-seine catches, North Atlantic Area, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age																							Total
	2			3			4			5			6			7			8			9			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
230-239	1	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
240-249	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250-259	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
260-269	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
270-279	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
280-289	4	-	4	1	-	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
290-299	2	-	2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
300-309	3	-	3	3	-	3	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
310-319	2	6	8	4	-	4	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
320-329	5	1	6	6	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
330-339	3	1	4	8	3	11	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
340-349	5	4	9	11	5	16	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26
350-359	5	4	9	11	5	16	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	26
360-369	8	4	12	15	4	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
370-379	5	4	9	27	10	37	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
380-389	3	4	7	29	8	37	4	1	5	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	52
390-399	5	7	12	38	10	49	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65
400-409	8	7	15	45	26	71	4	2	6	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	97
410-419	3	7	10	42	30	72	1	1	2	5	-	5	1	-	1	-	-	-	-	-	-	-	-	-	90
420-429	9	5	14	64	46	111	2	1	3	8	2	10	-	1	1	1	-	1	-	-	-	-	-	-	140
430-439	6	4	10	54	42	96	4	1	5	16	1	17	-	-	-	-	-	-	-	-	-	-	-	-	128
440-449	-	4	4	44	50	94	7	2	9	15	4	19	-	-	-	-	-	-	-	-	-	-	-	-	126
450-459	6	6	12	28	53	81	8	2	10	23	5	28	1	-	1	-	-	-	-	-	-	-	-	-	132
460-469	-	4	4	24	44	68	8	2	10	26	8	34	3	-	3	-	-	-	-	-	-	-	-	-	119
470-479	2	3	5	16	47	63	9	5	14	47	8	55	2	-	2	-	-	-	-	-	-	-	-	-	139
480-489	2	2	4	22	50	72	11	8	19	37	17	54	6	1	7	-	-	-	-	-	-	-	-	-	156
490-499	2	2	4	14	40	54	15	10	25	42	14	56	6	-	6	-	-	-	-	-	-	-	-	-	145
500-509	-	2	2	7	38	45	11	7	18	50	27	77	7	1	8	1	-	1	-	-	-	-	-	-	151
510-519	-	2	2	7	32	39	13	8	21	48	46	94	6	3	9	1	-	1	-	-	-	-	-	-	166
520-529	-	1	1	5	28	33	9	12	21	63	43	106	6	-	6	-	1	1	-	-	-	-	-	-	168
530-539	-	1	1	2	11	13	7	5	12	53	44	97	9	4	13	1	-	1	1	-	1	-	-	-	138
540-549	-	1	1	1	9	10	5	11	16	43	49	92	5	3	8	-	-	-	-	-	-	-	-	-	127
550-559	-	-	-	-	2	2	8	9	17	48	60	108	6	4	10	3	-	3	-	-	-	-	-	-	140
560-569	-	-	-	-	7	7	7	8	15	48	62	110	5	4	9	1	1	2	-	-	-	-	-	-	143
570-579	-	-	-	1	7	8	2	12	14	31	55	86	9	8	17	1	-	1	-	-	-	-	-	-	126
580-589	-	-	-	-	1	1	-	15	15	35	66	101	6	10	16	1	-	1	-	-	-	-	-	-	134
590-599	-	-	-	-	2	2	-	8	8	23	62	85	4	11	15	2	2	4	-	-	-	-	-	-	114
600-609	-	-	-	-	1	1	2	6	8	11	61	72	6	6	12	2	3	5	-	-	-	1	-	1	99
610-619	-	-	-	-	2	2	-	5	5	15	49	64	6	11	17	3	2	5	-	-	-	-	-	-	93
620-629	-	-	-	-	4	4	-	4	4	15	46	61	5	9	14	-	-	-	1	-	1	-	-	-	84
630-639	-	-	-	-	-	-	1	5	6	8	45	53	5	10	15	2	1	3	-	-	-	-	-	-	77
640-649	-	-	-	-	-	-	-	3	3	10	29	39	7	6	13	2	3	5	-	-	-	1	-	1	61

Appendix Table 13.--Weight frequency distributions in samples from purse-seine catches, North Atlantic Area, 1956 (continued)

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age																							Total
	2			3			4			5			6			7			8			9			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
650-659	-	-	-	-	-	-	-	2	2	8	31	39	3	9	12	1	1	2	1	-	1	-	-	-	56
660-669	-	-	-	-	-	-	-	2	2	3	24	27	3	7	10	-	2	2	1	-	1	-	-	-	42
670-679	-	-	-	-	-	-	-	1	1	2	26	28	3	2	5	1	1	2	2	-	2	-	-	-	38
680-689	-	-	-	-	-	-	-	1	1	2	17	19	4	7	11	2	-	2	-	-	-	-	-	-	33
690-699	-	-	-	-	-	-	-	1	1	4	13	17	2	7	9	1	-	1	-	-	-	-	-	-	28
700-709	-	-	-	-	-	-	-	-	-	-	13	13	2	5	7	-	2	2	-	-	-	-	-	-	22
710-719	-	-	-	-	-	-	-	1	1	3	8	11	3	7	10	-	3	3	-	-	-	-	-	-	25
720-729	-	-	-	-	-	-	-	-	-	2	8	10	2	3	5	1	1	2	-	3	3	-	-	-	20
730-739	-	-	-	-	-	-	-	1	1	-	7	7	2	2	4	-	1	1	1	-	1	-	-	-	14
740-749	-	-	-	-	-	-	-	-	-	-	9	9	1	2	3	-	1	1	-	-	-	-	-	-	13
750-759	-	-	-	-	-	-	-	1	1	1	3	4	-	3	3	-	1	1	-	-	-	-	-	-	9
760-769	-	-	-	-	-	-	-	-	-	1	5	6	-	5	5	-	-	-	-	-	-	-	-	-	11
770-779	-	-	-	-	-	-	-	-	-	-	2	2	-	5	5	-	-	-	-	-	-	-	-	-	7
780-789	-	-	-	-	-	-	-	1	1	-	2	2	-	2	2	-	-	-	-	1	1	-	-	-	6
790-799	-	-	-	-	-	-	-	-	-	-	3	3	-	2	2	-	1	1	-	-	-	-	-	-	6
800-809	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	1	-	-	-	-	-	-	2
810-819	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	2	2	-	2	2	-	-	-	5
820-829	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
830-839	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
840-849	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
850-859	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
860-869	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1	2	-	-	-	3
870-879	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	1
880-889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
890-899	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
900-909	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
910-919	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
920-929	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2
930-939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
940-949	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
950-959	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
960-969	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
970-979	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
980-989	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
990-999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1
Total . .	92	87	179	530	620	1152	146	167	313	754	978	1732	136	161	297	27	34	61	8	7	15	2	2	4	3753

Appendix Table 14.--Weight frequency distributions in samples from purse-seine catches, North Carolina fall fishery, 1956

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age																								Total
	0			1			2			3			4			5			6			7			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
0-9	12	2	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
10-19	18	21	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
20-29	4	6	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
30-39	13	16	30	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
40-49	8	10	18	5	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28
50-59	6	4	10	19	20	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
60-69	2	1	3	22	31	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56
70-79	1	1	2	20	29	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51
80-89	-	-	-	22	21	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43
90-99	-	-	-	5	6	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
100-109	-	-	-	4	6	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
110-119	-	-	-	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
120-129	-	-	-	3	6	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
130-139	-	-	-	4	3	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
140-149	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
150-159	-	-	-	2	6	8	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
160-169	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
170-179	-	-	-	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
180-189	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
190-199	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
200-209	-	-	-	-	1	1	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2
210-219	-	-	-	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
220-229	-	-	-	2	1	3	1	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	6
230-239	-	-	-	6	3	9	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
240-249	-	-	-	4	2	6	3	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
250-259	-	-	-	5	1	6	3	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
260-269	-	-	-	4	4	8	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
270-279	-	-	-	4	1	5	6	3	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
280-289	-	-	-	3	2	5	12	2	14	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	20
290-299	-	-	-	2	4	6	6	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
300-309	-	-	-	1	-	1	13	4	17	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	21
310-319	-	-	-	-	1	1	10	3	13	2	1	3	-	-	-	1	-	1	-	-	-	-	-	-	18
320-329	-	-	-	1	-	1	15	9	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
330-339	-	-	-	-	-	-	6	10	16	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	17
340-344	-	-	-	-	1	1	5	4	9	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	11
350-359	-	-	-	-	-	-	6	5	11	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	14
360-369	-	-	-	1	-	1	9	5	14	2	-	2	-	-	-	1	-	1	-	-	-	-	-	-	18
370-379	-	-	-	-	-	-	3	8	11	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	13
380-389	-	-	-	-	-	-	2	5	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
390-399	-	-	-	-	-	-	-	9	9	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	12
400-409	-	-	-	-	-	-	1	3	4	1	-	1	-	-	-	1	-	1	-	-	-	-	-	-	6
410-419	-	-	-	-	-	-	2	5	7	2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	11
420-429	-	-	-	-	-	-	-	1	1	2	1	3	-	-	-	-	-	-	-	-	-	-	-	-	4
430-439	-	-	-	-	-	-	1	3	4	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-	7
440-449	-	-	-	-	-	-	-	1	1	4	2	6	1	-	1	1	-	1	-	-	-	-	-	-	9

Appendix Table 14.--Weight frequency distributions in samples from purse-seine catches, North Carolina fall fishery, 1956 (continued)

(M = male, F = female, T = total, including specimens for which sex was not determined)

Weight (g.)	Age																							Total
	0			1			2			3			4			5			6			7			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
450-459	-	-	-	-	-	-	2	1	3	4	2	6	-	-	-	2	-	2	-	-	-	-	-	-	11
460-469	-	-	-	-	-	-	1	1	2	4	2	6	1	-	1	-	-	-	-	-	-	-	-	-	9
470-479	-	-	-	-	-	-	1	1	2	12	-	12	2	-	2	3	-	3	-	-	-	-	-	-	19
480-489	-	-	-	-	-	-	1	1	2	11	3	14	-	-	-	1	1	2	-	-	-	-	-	-	18
490-499	-	-	-	-	-	-	-	1	1	8	8	16	4	1	5	10	-	10	-	-	-	-	-	-	32
500-509	-	-	-	-	-	-	-	2	2	10	11	21	1	-	1	9	-	9	1	-	1	-	-	-	34
510-519	-	-	-	-	-	-	-	1	1	11	5	16	1	1	2	14	1	15	1	-	1	-	-	-	35
520-529	-	-	-	-	-	-	-	1	1	9	8	17	3	2	5	13	2	15	-	-	-	-	-	-	38
530-539	-	-	-	-	-	-	1	2	3	8	10	18	3	-	3	7	3	10	-	-	-	-	-	-	34
540-549	-	-	-	-	-	-	-	-	-	4	12	16	4	1	5	21	7	28	2	-	2	-	-	-	51
550-559	-	-	-	-	-	-	-	-	-	2	10	12	1	1	2	15	4	19	4	1	5	-	-	-	38
560-569	-	-	-	-	-	-	-	1	1	3	8	11	3	4	7	16	9	25	1	1	2	-	-	-	46
570-579	-	-	-	-	-	-	-	2	2	3	10	13	-	1	1	5	8	13	1	1	2	-	-	-	31
580-589	-	-	-	-	-	-	2	1	3	-	7	7	-	1	1	8	15	23	-	1	1	-	-	-	35
590-599	-	-	-	-	-	-	-	-	-	-	10	10	3	4	7	7	4	11	2	2	4	-	-	-	32
600-609	-	-	-	-	-	-	-	-	-	1	8	9	-	1	1	9	10	19	1	2	3	1	-	1	33
610-619	-	-	-	-	-	-	-	-	-	-	5	5	-	4	4	5	11	16	1	2	3	1	-	1	29
620-629	-	-	-	-	-	-	-	-	-	-	2	2	-	4	4	1	11	12	-	1	1	1	1	2	21
630-639	-	-	-	-	-	-		-	-	-	3	3	1	3	4	-	13	13	2	1	3	-	1	1	24
640-649	-	-	-	-	-	-	-	-	-	-	4	4	-	1	1	3	8	11	-	-	-	1	-	1	17
650-659	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	8	8	-	3	3	-	-	-	13
660-669	-	-	-	-	-	-	-	-	-	-	2	2	-	2	2	1	4	5	-	1	1	-	-	-	10
670-679	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	5	5	-	1	1	-	-	-	7
680-689	-	-	-	-	-	-	-	-	-	-	1	1	-	2	2	3	3	6	-	3	3	-	-	-	12
690-699	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	1	2	3	-	-	-	7
700-709	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	5	5	-	-	-	-	-	-	6
710-719	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	3	3	-	-	-	-	-	-	4
720-729	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	2	2	-	-	-	6
730-739	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	-	-	-	-	1	1	5
740-749	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
750-759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	1	-	-	-	2
760-769	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
770-779	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
780-789	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
790-799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800-809	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
810-819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
820-829	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
830-839	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
840-849	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
850-859	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
860-869	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
870-879	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
880-889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
890-899	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
900-910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1
Total . .	64	61	127	147	157	306	118	107	225	114	146	260	29	36	65	157	148	305	17	30	47	4	3	7	1342

Appendix Table 15.--Mean fork length and weight in samples from purse-seine catches, South Atlantic Area, excluding the North Carolina fall fishery, 1956

(Numbers of fish in parentheses)

Age	Males	Females	Both sexes
FORK LENGTH (mm.)			
1 ...	158.2 (1865)	160.9 (2058)	159.4 (3923)
2 ...	195.3 (42)	199.3 (50)	197.5 (92)
3 ...	201.0 (2)	219.0 (5)	213.8 (7)
4 ...	- -	224.0 (1)	224.0 (1)
5 ...	- -	234.0 (1)	234.0 (1)
WEIGHT (g.)			
1 ...	64.3 (1865)	69.3 (2057)	66.9 (3922)
2 ...	126.2 (42)	141.0 (50)	134.2 (92)
3 ...	137.5 (2)	191.6 (5)	176.1 (7)
4 ...	- -	217.0 (1)	217.0 (1)
5 ...	- -	224.0 (1)	224.0 (1)

Appendix Table 16.--Mean fork length and weight in samples from spring pound-net catches, Chesapeake Bay Area, 1956

(Numbers of fish in parentheses)

Age	Males	Females	Both sexes
	FORK LENGTH (mm.)		
0	166.0 (1)	- -	166.0 (1)
1	164.1 (72)	166.9 (70)	165.5 (142)
2	212.1 (106)	215.6 (96)	213.8 (202)
3	229.1 (12)	225.3 (10)	227.4 (22)
4	236.0 (1)	238.0 (2)	237.3 (3)
5	276.7 (6)	279.5 (4)	277.8 (10)
6	- -	280.0 (1)	280.0 (1)
7	- -	- -	- -
8	- -	- -	- -
9	- -	303.0 (1)	303.0 (1)
	WEIGHT (g.)		
0	79.0 (1)	- -	79.0 (1)
1	76.1 (72)	81.2 (70)	78.7 (142)
2	163.9 (106)	167.0 (96)	163.9 (202)
3	233.4 (12)	199.0 (10)	217.8 (22)
4	212.0 (1)	232.0 (2)	225.3 (3)
5	345.3 (6)	389.5 (4)	363.0 (10)
6	- -	345.0 (1)	345.0 (1)
7	- -	- -	- -
8	- -	- -	- -
9	- -	522.0 (1)	522.0 (1)

Appendix Table 17.--Mean fork length and weight in samples from purse-seine catches, Chesapeake Bay Area, 1956

(Numbers of fish in parentheses)

FORK LENGTH (mm.)			
Age	Males	Females	Both sexes
1	186.9 (1080)	187.7 (1190)	187.3 (2270)
2	222.1 (118)	222.4 (132)	222.3 (250)
3	- -	293.0 (1)	293.0 (1)
WEIGHT (g.)			
1	116.8 (1080)	118.2 (1190)	117.6 (2270)
2	197.7 (118)	194.8 (132)	196.2 (250)
3	- -	388.0 (1)	388.0 (1)

Appendix Table 18.--Mean fork length and weight in samples from spring pound-net catches, Middle Atlantic Area, 1956

(Numbers of fish in parentheses)

Age	Males	Females	Both sexes
FORK LENGTH (mm.)			
2	260.9 (17)	273.1 (12)	265.9 (29)
3	282.4 (97)	289.0 (119)	286.1 (216)
4	299.2 (53)	307.8 (87)	304.5 (140)
5	306.1 (321)	314.5 (317)	310.3 (638)
6	317.5 (81)	325.7 (98)	322.0 (179)
7	326.7 (24)	331.0 (47)	329.5 (71)
8	328.4 (9)	338.9 (11)	334.2 (20)
9	338.5 (4)	346.1 (7)	343.4 (11)
10	324.5 (2)	361.0 (1)	336.7 (3)
11	- -	- -	- -
12	336.0 (1)	- -	336.0 (1)
WEIGHT (g.)			
2	309.0 (17)	351.5 (12)	326.6 (29)
3	381.6 (97)	418.1 (119)	401.7 (216)
4	443.7 (53)	489.7 (87)	472.3 (140)
5	477.6 (321)	523.9 (317)	500.6 (638)
6	537.2 (81)	589.8 (98)	566.0 (179)
7	599.6 (24)	628.6 (47)	618.8 (71)
8	616.1 (9)	668.8 (11)	645.1 (20)
9	654.5 (4)	742.3 (7)	710.4 (11)
10	559.0 (2)	767.0 (1)	628.3 (3)
11	- -	- -	- -
12	593.0 (1)	- -	593.0 (1)

Appendix Table 19.--Mean fork length and weight in samples from purse-seine catches, Middle Atlantic Atlantic Area, 1956

(Numbers of fish in parentheses)

Age	Males	Females	Both sexes
	FORK LENGTH (mm.)		
1	220.1 (231)	221.7 (222)	220.9 (453)
2	249.7 (1505)	253.9 (1565)	251.8 (3070)
3	282.4 (738)	289.1 (793)	285.9 (1531)
4	298.9 (81)	305.3 (68)	301.8 (149)
5	307.1 (149)	314.9 (129)	310.8 (278)
6	312.2 (17)	321.3 (19)	317.0 (36)
7	312.0 (1)	323.0 (4)	320.8 (5)
8	320.0 (1)	344.0 (1)	332.0 (2)
	WEIGHT (g.)		
1	202.6 (231)	209.6 (222)	206.0 (453)
2	296.1 (1505)	314.3 (1565)	305.4 (3070)
3	425.7 (738)	467.8 (793)	447.5 (1531)
4	500.5 (81)	546.8 (68)	521.7 (149)
5	558.2 (149)	609.5 (129)	582.0 (278)
6	586.9 (17)	666.4 (19)	628.8 (36)
7	566.0 (1)	662.5 (4)	643.2 (5)
8	619.0 (1)	758.0 (1)	688.5 (2)

Appendix Table 20.--Mean fork length and weight in samples from purse-seine catches, North Atlantic Area, 1956

(Numbers of fish in parentheses)

Age	Males	Females	Both sexes
	FORK LENGTH (mm.)		
2	272.8 (92)	281.1 (87)	276.8 (179)
3	286.2 (530)	294.2 (620)	290.5 (1150)
4	301.3 (146)	311.8 (167)	306.9 (313)
5	309.3 (754)	318.7 (979)	314.6 (1733)
6	316.4 (136)	326.2 (161)	321.7 (297)
7	321.0 (27)	334.2 (34)	328.4 (61)
8	331.0 (8)	341.7 (7)	336.0 (15)
9	329.5 (2)	349.5 (2)	339.5 (4)
	WEIGHT (g.)		
2	379.2 (92)	412.3 (87)	395.3 (179)
3	421.7 (530)	463.8 (620)	444.4 (1150)
4	487.1 (146)	550.8 (167)	521.1 (313)
5	531.3 (754)	590.5 (978)	564.7 (1732)
6	581.3 (136)	643.6 (161)	615.1 (297)
7	603.7 (27)	700.2 (34)	657.5 (61)
8	676.5 (8)	779.6 (7)	724.6 (15)
9	613.5 (2)	917.5 (2)	765.5 (4)

Appendix Table 21.--Mean fork length and weight in samples from purse-seine catches, North Carolina fall fishery, 1956

(Numbers of fish in parentheses)

Age	Males	Females	Both sexes
	FORK LENGTH (mm.)		
0	116.1 (64)	121.0 (61)	118.5 (125)
1	185.1 (147)	178.2 (157)	181.5 (304)
2	257.7 (118)	267.3 (107)	262.3 (225)
3	292.5 (114)	302.6 (146)	298.1 (260)
4	302.9 (29)	312.6 (36)	308.2 (65)
5	306.7 (157)	317.5 (148)	312.0 (305)
6	311.6 (17)	322.3 (30)	318.4 (47)
7	324.0 (4)	326.3 (3)	325.0 (7)
	WEIGHT (g.)		
0	27.4 (64)	28.7 (61)	28.0 (125)
1	122.8 (147)	105.9 (157)	114.1 (304)
2	326.9 (118)	369.2 (107)	347.0 (225)
3	479.3 (114)	545.2 (146)	516.3 (260)
4	523.2 (29)	595.6 (36)	563.3 (65)
5	546.4 (157)	620.7 (148)	582.4 (305)
6	579.5 (17)	677.1 (30)	641.8 (47)
7	624.2 (4)	667.0 (3)	642.6 (7)

MS #940

INT.DUP.,D.C.60- 73214